

FACT SHEET: BIOFUELS

October 2005

What are biofuels?

Biofuels are renewable energy sources made from biomass (plant matter such as trees, grasses, agricultural crops or other biological material) that can be used for our transportation needs.

The two most common types of biofuels are ethanol and biodiesel.

- **Ethanol** is an alcohol made by fermenting any biomass high in carbohydrates such as corn, sugar cane, wheat or barley. It is the same type of alcohol found in beer and wine. Ethanol is commonly used as a fuel additive to reduce carbon monoxide emissions from vehicles.
- **Biodiesel** is made by combining alcohol (usually methanol) with vegetable oil, animal fat or recycled cooking greases. It can be used as an additive to reduce vehicle emissions (typically 20%) or in its pure form as a renewable alternative fuel for diesel engines.

Sources: National Renewable Energy Laboratory http://www.nrel.gov/clean_energy/biofuels.html
Alternative Fuels Data Center: <http://www.eere.energy.gov/afdc/altfuel/altfuels.html>

What types of vehicles can run on biofuels?

Diesel Engines can typically run on biodiesel with little or no modification to the engine or the fuel system. It can be used in its pure form (called B100) or as a blend with diesel fuel at any ratio. Biodiesel provides similar horsepower and fuel economy as petroleum diesel. Some problems may occur during cold weather because biodiesel thickens more than diesel fuel.

- Examples of 2006 Diesel Vehicles: Volkswagen Beetle, Golf, Jetta, Mercedes-Benz E320 Cdi, Jeep Liberty/Cherokee 4WD

Flexible Fuel Vehicles (FFV) can run on conventional gasoline, ethanol or a combination of the two. Most FFVs use E85, a mixture of 85 percent ethanol and 15 percent gasoline. Many federal, state, and local government vehicles, as well as light-duty vehicles, buses, and trucks currently run on ethanol. Examples of FFVs include some models of the Ford Taurus, Chevy Tahoe and Dodge Stratus.

- Examples of 2006 Flexible Fueled Vehicles: Chevrolet Impala, Chrysler Sebring, Dodge Stratus, Ford Taurus, GMC K1500 Sierra, Dodge Ram 1500 Pickup

Source: <http://www.fueleconomy.gov/feg/byfueltype.htm>

What are the environmental benefits of biofuels?

Biodiesel

- Pure biodiesel reduces carbon dioxide emissions by more than 75% over petroleum diesel.
- A 20% blend of biodiesel reduces carbon dioxide emissions by 15%.
- Produces fewer particulate matter, carbon monoxide and sulfur dioxide emissions.

- Biodiesel is much less combustible than petroleum diesel (flash point greater than 150°C, compared to 77°C).

Ethanol

- Most ethanol-fueled vehicles produce lower carbon monoxide and carbon dioxide emissions and the same or lower levels of hydrocarbon and non-methane hydrocarbon emissions.
- Oxides of nitrogen (NOx) emissions are about the same for ethanol and gasoline vehicles. E85 has fewer highly volatile components than gasoline and so has fewer evaporative emissions.

Source: U.S. Department of Energy: <http://www.eere.energy.gov/afdc/altfuel/altfuels.html>

How much biodiesel and ethanol is used in the US?

<i>Ethanol (E85)*</i>	<i>Biodiesel</i>
2004 – 22.9 million gallons	2004 – 36.6 million gallons
2003 – 20.6 million gallons	2003 – 26.8 million gallons
2002 – 18.2 million gallons	2002 – 16.9 million gallons
2001 – 15.0 million gallons	2001 – 7.0 million gallons
2000 – 12.3 million gallons	2000 – 6.8 million gallons

*Does not include ethanol used in gasoline as an oxygenate.

<i>Ethanol in gasoline</i>	
2004 – 2.3 billion gallons	
2003 – 1.9 billion gallons	
2002 – 1.4 billion gallons	
2001 – 1.17 billion gallons	
2000 – 1.14 billion gallons	

Source: Energy Information Administration <http://www.eia.doe.gov/emeu/aer/txt/ptb1007.html>

What are the economics of biofuels in Washington state?

Ethanol

- Washington State is one of the major wheat producing states in the country.
- A straw based industry in eastern Washington would have a significant positive economic impact on the region. The counties of Adams, Franklin, Grant, and Lincoln counties would see an economic value-added of \$19.6 million.
- Over 100 million gallons of ethanol could be produced from just the straw generated in Whitman and Lincoln counties.
- The primary market for ethanol is as a gasoline additive for octane enhancement and fuel oxygenation to help control vehicle emissions as per federally mandated.

- Including E85 and oxygenates in gasoline, over 2 billion gallons of ethanol were used in the U.S. in 2004.

Source: Washington State University (PDF): <http://www.newuses.org/pdf/WSUCEEP2001084.pdf>

Biodiesel

- A viable biodiesel industry in Washington will require the availability of local oil seed to reduce dependency on importation of raw oil from the Midwest.
- Transportation costs will dictate that any biodiesel production facility will need to be located in very close proximity to the available feedstocks.
- Two feedstock crops, mustard and canola, are particularly well suited for Eastern Washington, providing high yields without irrigation.
- The 500,000 acres in the Spokane region could produce enough oil to make 25 million gallons of biodiesel.
- In order for the farmers to be able to supply oil for use in producing biodiesel, a complete oil seed industry needs to be established, including an oil seed crushing facility and markets for the meal left after the oil has been extracted.

Source: Spokane County Conservation District: <http://www.sccd.org/biodiesel/oilseedcrops.shtml>

Facts about Diesel and Biodiesel usage in Washington state

Annual diesel sales in WA – 1 billion gallons

State agency diesel use – 36 million gallons a year

- Governor Locke's 2004 executive order sets goal of 5% biodiesel
- GA recently added biodiesel to the state fuel procurement contract
- WA State Ferries (WSF) uses about 20 million gallons a year

Annual biodiesel sales in WA – 1.5 million gallons

- Generally to large public fleets like City of Seattle and WSF
- 20 retail stations across the state
- Made from imported Midwest soybean oil

In-state manufacture

- Seattle Biodiesel facility is first in-state production plant (opened 3/05). Imports soybean oil from Midwest
- Other facilities in various stages of development

Source: John Kim Lyons, WSU Energy Program, May 2005

What incentives are available in Washington state related to biofuels?

Alternative Fuels Tax Deduction - Until July 1, 2009: (RCW 82.04.4334 and 82.08.955)

Washington State House of Representatives
Compiled by House Democratic Caucus staff

- A B&O tax deduction is available for the sale or distribution of biodiesel or alcohol fuel (comprised of at least 85% alcohol fuel by volume).
- Additionally, fuel delivery vehicles and machinery, equipment, and related services that are used for the retail sale of a biodiesel or alcohol fuel (if used to distribute these fuels for 75% or more of the time) are exempt from state retail fuel sales and use taxes.

Alternative Fuel Vehicle (AFV) Annual Fee
(RCW 82.38.075)

In order to encourage the use of nonpolluting fuels, owners of compressed natural gas (CNG) and liquefied petroleum gas (LPG) powered vehicles are required to pay an annual license fee, based on gross vehicle weight rating (GVWR), instead of motor fuel excise taxes. The fee is calculated as follows:

GVW	Fee
Less than 10,000 pounds (lbs.)	\$45
10,001 - 18,000 lbs.	\$80
18,001 - 28,000 lbs.	\$110
28,001 - 36,000 lbs.	\$150
More than 36,000 lbs.	\$250

To determine the actual annual license fee imposed by this section for a registration year, the appropriate dollar amount given in the above schedule must be multiplied by the motor vehicle fuel tax rate in cents per gallon (as established by RCW 82.36.025) effective on July 1 of the preceding calendar year, and the product be divided by \$0.12. In addition, there is a \$5 handling fee.

Biofuels Production Tax Exemption - Until July 1, 2009:
(RCW 82.04.260, 82.08.955, 82.12.955, 82.29A.135, and 84.36.635)

- Investments in buildings, equipment and labor for the purpose of manufacturing biodiesel, biodiesel feedstock, wood biomass fuel, or alcohol fuel are eligible for the deferral of state and local sales and use taxes.
- Qualifying buildings, equipment and land used in the manufacturing of alcohol fuel, wood biomass fuel, biodiesel, or biodiesel feedstocks are also exempt from state and local property and leasehold taxes for a period of six years.
- Additionally, a reduced Business & Occupation tax rate of 0.138% applies to persons engaged in manufacturing of alcohol fuel, biodiesel fuel, or biodiesel feedstock.

Clean School Bus Pilot Project - Expired 9/1/05
(RCW 28A.160.804)

Washington State House of Representatives

Compiled by House Democratic Caucus staff

- Two school districts were selected to participate in a pilot project on the use of biodiesel with ultra low sulfur diesel (ULSD) in school buses, with blends of 80% ultra low sulfur diesel and 20% biodiesel (B20). The pilot project began in September of 2003, with emissions testing at specified intervals throughout the project.
- The Superintendent of Public Instruction submits a report of findings, including issues related to the maintenance of the vehicles, to the legislature by September 1, 2005.

Sources: Alternative Fuels Data Center http://www.eere.energy.gov/afdc/progs/state_summary.cgi?afdc/WA